



November 8, 2012

10 CFR 50.73

Docket No. 50-443  
SBK-L-12230

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

Seabrook Station

Licensee Event Report (LER) 2012-003-00

Reactor Trip Due to Circuit Board Failure that Closes Feed Regulating Valve

Enclosed is Licensee Event Report (LER) 2012-003-00. This LER reports an event that occurred at Seabrook Station on September 14, 2012. This event is being reported pursuant to the requirements of 10 CFR 50.73(a)(2)(iv)(A).

Should you require further information regarding this matter, please contact Mr. Michael O'Keefe, Licensing Manager, at (603) 773-7745.

Sincerely,

NextEra Energy Seabrook, LLC

A handwritten signature in black ink, appearing to read "Kevin T. Walsh", written over a horizontal line.

Kevin T. Walsh  
Site Vice President

cc: NRC Region I Administrator  
J. G. Lamb, NRC Project Manager  
NRC Senior Resident Inspector

IE22  
NR2

NRC FORM 366 (10-2010)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104		EXPIRES: 10/31/2013																																								
<b>LICENSEE EVENT REPORT (LER)</b>					Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to <a href="mailto:infocollects.resource@nrc.gov">infocollects.resource@nrc.gov</a> , and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.																																										
1. FACILITY NAME <div style="text-align: center;">Seabrook Station</div>					2. DOCKET NUMBER <div style="text-align: center;">05000443</div>		3. PAGE <div style="text-align: center;">1 OF 3</div>																																								
4. TITLE <div style="text-align: center;">Reactor Trip Due to Circuit Board Failure that Closes Feed Regulating Valve</div>																																															
5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED																																						
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER																																					
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9. OPERATING MODE <div style="text-align: center;">1</div>			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply) <table style="width:100%; font-size: x-small;"> <tr> <td><input type="checkbox"/> 20.2201(b)</td> <td><input type="checkbox"/> 20.2203(a)(3)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(C)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)</td> </tr> <tr> <td><input type="checkbox"/> 20.2201(d)</td> <td><input type="checkbox"/> 20.2203(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(1)</td> <td><input type="checkbox"/> 20.2203(a)(4)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ix)(A)</td> </tr> <tr> <td rowspan="5">10. POWER LEVEL <div style="text-align: center;">085</div></td> <td><input type="checkbox"/> 20.2203(a)(2)(ii)</td> <td><input type="checkbox"/> 50.36(c)(1)(ii)(A)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(A)</td> <td><input type="checkbox"/> 73.71(a)(4)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iv)</td> <td><input type="checkbox"/> 50.46(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(B)</td> <td><input type="checkbox"/> 73.71(a)(5)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(C)</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(vi)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(D)</td> <td>Specify in Abstract below or in NRC Form 366A</td> </tr> </table>								<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	10. POWER LEVEL <div style="text-align: center;">085</div>	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A
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12. LICENSEE CONTACT FOR THIS LER																																															
NAME <div style="text-align: center;">Michael O'Keefe, Licensing Manager</div>								TELEPHONE NUMBER (Include Area Code) <div style="text-align: center;">603-773-7745</div>																																							
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT																																															
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX																																						
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<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO																																															
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) <p>On September 14, 2012 at 8:25 pm while operating at approximately 85% power, Seabrook Station experienced an automatic reactor trip on low steam generator (SG) water level. The failure of a printed circuit board in the 7300 process control system caused the feedwater regulating valve for SG-C to close. As a result, the water level in SG-C decreased to the low level trip setpoint and initiated an automatic reactor trip. The emergency feedwater system actuated on low SG level, and plant equipment functioned as expected. No adverse consequences resulted from this event.</p> <p>The root cause of the event was the failure of an internal component on a printed circuit board (manual nuclear tracking driver board) in the 7300 control system. The corrective actions included replacing the failed circuit card and three additional cards in the same instrument loop.</p>																																															

LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET

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## NARRATIVE

**Description of Event**

On September 14, 2012 at 8:25 pm while operating at approximately 85% power, Seabrook Station experienced an automatic reactor trip on low steam generator (SG)[AB, SG] water level. The failure of a printed circuit board [JB, CBD] in the 7300 process control system caused the feedwater regulating valve [SJ, FCV] for SG-C to close. As a result, the water level in SG-C decreased to the low level trip setpoint and initiated an automatic reactor trip. The emergency feedwater system [BA] actuated on low SG level, and plant equipment functioned as expected.

**Cause of Event**

The root cause of the event was the failure of an internal component on a printed circuit board (manual nuclear tracking driver board) in the 7300 control system.

**Analysis of the Event**

The 7300 control system instrument loops for the feedwater regulating valves include three circuit boards: a nuclear controller board (NCB), an automatic (auto) nuclear tracking driver (NTD) board, and a manual NTD board. During operation in auto, the NCB receives inputs from the SG level controller and the difference between feed and steam flow. The NCB then provides an input to the auto NTD board, which provides an output to control the position of the feedwater regulating valve. If the manual NTD board fails when the instrument loop is in auto, the loop will revert to a manual mode that is controlled by the auto NTD board.

During operation in the manual mode, the output of the manual NTD board controls the position of the feedwater regulating valve. In this mode, the NCB and auto NTD board track the output of the manual NTD to permit a bump less transfer to the auto mode.

A failure of the manual NTD board initiated this event. A failure of a circuit board is detected when the fuse [JB, FU] on the circuit board opens. The internal failure on the manual NTD board transferred control to the manual mode and also caused the manual NTD board output to decrease (which provided a close signal to the feedwater regulating valve) prior to the fuse opening. At the same time, the auto NTD board tracked the decreasing output from the manual NTD board. Subsequently, when the fuse on the manual NTD opened, the instrument loop reverted to the manual mode with control by the auto NTD board. However, since the output of the auto NTD had decreased, the feedwater regulating valve was nearly closed, and SG water level decreased to the low level reactor trip setpoint.

This event resulted in a valid actuation of the reactor protection system and met the reporting criteria of 10 CFR 50.72(b)(3)(iv)(A). A four hour report was made to the NRC at approximately 2205 on September 14, 2012 (event number 48310). The operators responded to the plant trip in accordance with approved procedures, and safety systems functioned as expected. No adverse consequences resulted from this event, and this incident had no adverse impact on the health and safety of the public or the plant and its personnel. This event did not involve a safety system functional failure. No inoperable structures, systems, or components contributed to this event.

**Corrective Actions**

The corrective actions included replacing the failed circuit card and three additional cards in the same instrument loop.

# LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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## NARRATIVE

### Similar Events

Seabrook has experienced no similar events within the last five years involving a plant trip due to failure of a 7300 control system card.

### Additional Information

The Energy Industry Identification System (EIIS) codes are included in this LER in the following format: [EIIS system identifier, EIIS component identifier].